COOP'S TECHNOLOGY DIGEST

-A Timely Report On The World Of Communications-

Published as a confidential industry newsletter ten times per year by electronics and technology author *Robert B. Cooper*. Reports source checked for accuracy prior to publication; readers are cautioned to conduct their own verification of data prior to formulating business judgements based upon reports here. Data of unverified authenticity may be so-labelled as a guide to reader caution. The publisher draws upon 37 years of leading edge electronic industry media experience but can be misled by those with clever agendas. Subscription rates and contact numbers at bottom of this page.

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-IN THIS ISSUE-

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COOP'S TECHNOLOGY DIGEST

March 19, 1997 ◆ VOLUME 97-2-35

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THE LINCRAD EXCHANGE - "An Honest Difference of Opinion"

CTD 9608 (4 November 1996) reported on the expansion of TV3 (network) to a "TV4" service utilising VHF channels previously unused in major metropolitan centres. Within that report we included our own cautions concerning the level of performance to be expected from existing consumer rooftop aerials when they attempt to receive the new "TV4" channels. To that point we offered the following comments (page 4):

"Normally a new national television service creates a mini-boom for the aerial manufacturers, distributors and riggers. This is not likely to be the case with TV4. Dunedin is the only market which will clearly require new viewer antennas (channel 11, vertical) to augment the pre-existing horizontally polarised VHF antennas. In some markets there will be a limited amount of "fine tuning" possible of consumer aerials. This would include:

"**Christchurch**: Channel 11 is likely to be degraded on existing aerials intended for channels 3, 6 and 8. The primary Christchurch antenna supplier, Lincrad Aerials, has specialised in high gain antennas with limited bandwidth (channel) coverage. Channel 11 is going to be troublesome for users of Lincrad aerials designed for optimised performance on channels 3-8.

"**Invercargill**: Existing aerials if of the optimised performance variety are for channels 1-3 and 7; channel 11 will be degraded for the same reason as Christchurch.

"**Palmerston North**: Same analysis as Christchurch but not as severe a problem since most of the aerials sold into the market were not optimised to begin with (i.e., Aimco, Hills and other brands sold primarily on North Island, are not of the optimised design family.)

"**Tauranga**: Same analysis as Palmerston North.

"**Wellington**: A unique problem. Channel 1 (TV1) and channel 2 (proposed channel 4) are not adjacent channels (a ham radio band exists between the two channels). Thus both can in fact be utilised in the same community (more commonly, Invercargill for example, 1 and 3 are co-used). Channels 1, 2 and 3 are located in 'band I,' our lowest frequency range. Antennas for band I are very difficult to implement if they are required to work on more than a single channel. Existing antennas using Wellington channel 1 (TV1) are going to work very poorly at channel 2. There could be a new model for Wellington designed that would compromise performance on channel 1 and add channel 2 in the process. Lacking that, TV4 in Wellington will have coverage problems. Add to this the 32 translator (relay) sites required to properly cover the region and the likelihood that few (if any) of these sites can be modified to add TV4 and you will have a significant cumulative coverage problem for TV4 in the Wellington market."

This drew on 17 February a communication from K.C. France of Cameron & Company (Barristers & Solicitors) which said in part:

"*We act for Lincrad Aerials Ltd.*

"Our client company is aggrieved by comments made in particular at page 5 of issue 9608 of your publication concerning aerials for TV4 on channel 11. The article specifically refers to Lincrad Aerials and clearly infers that Lincrad Aerials will not work on channel 11.

"This is not the case.

"The true situation is as follows.

"At page 5 you state that in Christchurch with TV4 on channel 11 that channel is likely to be degraded with aerials intended for channels 3, 6 and 8. *This is quite correct.* You then go on to say

that Lincrad has specialised in high gain aerials with limited bandwidth, *which is also quite correct.* The reason for this is that in many fringe areas a high gain aerial cut for specific channels can mean the different between reasonably good picture/sound or unacceptable TV performance. By far the greatest number of aerials that Lincrad has sold for the Christchurch metropolitan and suburban districts however is a three element design that will work on channel 11. Your article omits any reference to this product and is misleading.

"In the Wellington area you have published statements that antennas with band 1 are very difficult to implement if they are required to work on more than a single channel. It is our client's view that this is not correct. Lincrad has been manufacturing aerials that use channels 1 and 3 for many years, specifically for use in the Invercargill, Hamilton and Tauranga areas. Furthermore our clients believe it is no great problem to cater for channels 1 and 2. For the last two months Lincrad has been supplying considerable quantities of aerials to Wellington that are designed for channels 1, 2, 5 and 11. Reports on these aerials indicate there is no degradation of signal strength or directivity on channel 1.

"In the Invercargill area *Lincrad agree* that many aerials of many brands including their own *will not work effectively* on channel 11. Lincrad have however already designed a new aerial model to solve the problem of channel 11 in Invercargill without compromising channel 7 to any extent."

In our response we said, in part:

"(CTD) did not at any point say, '*the Lincrad aerials will not work on channel 11.*' What CTD did say, was:

'Channel 11 is likely to be degraded' and 'Channel 11 is going to be troublesome for users of Lincrad aerials designed for **optimised** performance on channels 3 - 8.' Your point that, 'By far the greatest number of aerials that Lincrad has sold for the Christchurch metropolitan and suburban districts however is a three element design that will work on channel 11. Your article omits any reference to this product and is misleading.'

"The 'article' made no pretence of surveying ALL aerials ever produced and sold in Christchurch. It correct states that 'channel 11 is likely to be degraded on existing aerials channels 3, 6 and 8 ... for users of Lincrad aerials designed for **optimised** performance on channels 3 - 8.' A 'three element design' may well 'work on channel 11' but nobody I know would ever make the claim that a 3 element antenna is an 'optimised design' (i.e., it takes just a few more than 3 elements to optimise an antenna over a frequency band as wide as channels 3 - 8). There is a huge difference between '**working** on channel 11' and being '**optimised** for channel 11.'

"As regards to Wellington, while it may be '(my) client's view' there is 'no great problem to cater for channels 1 and 2,' it is his view. Our view is that while it is certainly possible to build an antenna that will function well on channels 1 and 2 or 1 and 3, that to date we have not seen an antenna that will do 1 & 2 plus 5 and 11 all in one; **optimised**.

"CTD said, 'Existing antennas using Wellington channel 1 (TV1) are going to work very poorly at channel 2.' The pivotal word here is '**existing**.' That your client has created a new antenna that functions on channels 1 & 2 and 5 and 11 actually puts your client in agreement with CTD. If existing aerials covering channel 1 would work on channel 2 without replacement or modification, why the need for a new design?"

There would be more as the following response from K.C. France shows.

"*The point that we are making* is that your article specifically referred to Lincrad Aerials as specialising in high gain antennae and continued on to state that channel 11 is going to be troublesome for users of optimised Lincrad aerials. Our client's concern is that you firstly singled out its product from others and failed to refer to its wider product range. Your article clearly gives the impression that Lincrad does not produce other aerials suitable for channel 11. Our client has an increasing number of enquiries from suppliers to ascertain whether their aerials will work on channel 11 resulting from your article. Whether or not you intended it to be the case (which is irrelevant) you have created a detrimental opinion in the market place concerning our client's product.

"Your article makes no reference to antennae working on channels 1, 2 and 5 and 11 optimised. In any event the point is again that you are implying there are not aerials available to cope with the problem referred to in your article. Our point is that that is not the case and your article is misleading. Furthermore your article states that if a new design was made, it would compromise performance on channel 1 in order to add channel 2. That is also misleading. (1)

"The point we simply make is that our client does practice this technology. Mr. Roscoe has extensive experience in translator installation dating back to the early days of television in New Zealand. His experience includes that relating to stacked aerials including a 48 element phased array mounted on two sixty-five foot poles with a measured forward gain of 20 dBd. Our request remains that you publish a correction concerning in particular the matters arising from page 5 of issue 9608."

And our response to this:

"OK - without respect to whether your client is correct or CTD is correct - there is 'news value' in this exchange and what follows is text to appear in the next issue of CTD .

AN HONEST DIFFERENCE OF OPINION

CTD 9608 reported on the announcement by TV3 of their new 'TV4' service. In our review of the effects of this announcement, we voiced concerns that some existing home aerials in Christchurch, Invercargill, and Wellington will exhibit degraded performance on the new 'TV4' channels. We specifically mentioned the Christchurch market where we said:

"Channel 11 (new TV4) is likely to be degraded on existing aerials intended for channels 3, 6 and 8. The primary Christchurch antenna supplier, Lincrad Aerials, has specialised in high gain antennas with limited bandwidth (channel) coverage. Channel 11 its going to be troublesome for those users of Lincrad aerials which have been designed for **optimised** performance on channels 3-8."

Lincrad is concerned that readers would interpret this report to mean that ALL Lincrad aerials sold in Christchurch will have a problem with the new channel 11. They write, "By far the greatest number of aerials that Lincrad has sold for the Christchurch metropolitan and suburban districts is a three element design that will work on channel 11."

In other words, most of the Lincrad aerials in use within the Christchurch TV market region will work (2) on channel 11 because they are NOT of an **optimised** design (i.e., they favour no particular channel between 3 and 11).

With reference to existing aerials in use for Wellington, CTD wrote: "Antennas for band 1 are very difficult to implement if they are required to work on more than a single channel. Existing antennas using Wellington channel 1 (TV1) are going to work very poorly at channel 2 (the new TV4 channel). There could be a new model for Wellington designed that would compromise performance on channel 1 and add channel 2 in the process." Lincrad disagrees and says they have been manufacturing aerials that use channels 1 and 3 for many years specifically for use in the Invercargill, Hamilton and Tauranga areas. Furthermore Lincrad believes it is no great problem to cater for channels 1 and 2. For the past three months Lincrad has shipped a considerable quantity of aerials to Wellington that are designed for channels 1, 2, 5 and 11. Lincrad says that reports of those aerials indicate no degradation of signal strength or directivity on channel 1. Lincrad agrees with CTD that a new model was required for Wellington.

What is bothering Lincrad is, "*...an increasing number of enquiries from suppliers to ascertain whether their aerials will work on channel 11 resulting from the CTD analysis.*"

The bottom line in all of this is quite clear.

1) Any antenna supplier who offers you antennas claiming to include coverage of a new TV4 channel should be willing to state the following in writing:

a) The **gain-bandwidth** of the antenna (i.e., a statement of how much gain - referenced against a dipole or isotropic source - versus the frequency range for the antenna);

b) The **VSWR** (match) of the antenna as a function of bandwidth (i.e., a graph depicting the extent of impedance match to either 75 or 300 ohms throughout the claimed bandwidth coverage of the antenna;

c) The **1/2 power** (3 dB) points on the E and H planes for the antenna as well as the side and rear lobe performance. In particular, this information should be provided for the new TV4 channel to allow the installer to determine the directivity of the antenna. (Some antenna designs change their directional pattern as the channel changes - not a good situation when all transmitters are at the same location!)

Any manufacturer unwilling or unable to supply this basic "antenna performance data" very possibly does not know the characteristics for the product sold and should not be making "word claims" for the product. Word claims are meaningless; elementary performance data from actual antenna (test range) measurements at least gives the installer and ultimate consumer some specific points of comparison between competing antenna models and also serves as a 'come back' if the antenna performance turns out to be significantly different than "word claimed." CTD suggested to Lincrad our willingness to conduct such measurements on their various Wellington and Christchurch models; they responded "*...not inclined at this stage to provide (you) with test models.*"

LICENCES IN THE 12 GHz FREQUENCY BANDS

Ian Hutchings, Ministry of Commerce, Wellington

The recent article (CTD 97-01-34; "Battle for Microwave Frequencies") suggested there may be difficulties in frequency co-ordination (i.e., unsatisfactory interference situations) of licences in the 12 GHz bands as BCL, SKY and others move to implement new services. The basic frequency bands for satellite services are derived from the International Radio Regulations of the ITU and are a treaty level obligation of all countries.

The internationally agreed plan for DTH BSS TV systems is in the 11.7 - 12.2 GHz band (up to 12.5 GHz in Europe and different again in the Americas). This plan was created in 1977 and has a number of very specific beams, frequencies and PFDs (power flux densities) covering all countries. These are based on analogue technology, but other modulations that do not cause any greater interference than analogue signals are also permitted. This is the ITU "BSS Plan," and any other usage of these bands must not degrade or interfere with the planned usage. New Zealand has several beam coverages but there seems to be little prospect of the planned slots being implemented in this part of the world. Because of the need to protect these slots internationally there seems little likelihood of any "non plan compliant" satellite system being operated in the band. The plan is to be reviewed in October this year to incorporate more up to date parameters, particularly digital transmissions.

BCL are planning to operate their terrestrial DDN in this 11.7 to 12.2 GHz frequency band, and as there has been no plan compliant satellite use in this area of the world since 1977 (or indeed in much of the world) it seems a good bet. Use of the band makes the receiving technology more readily available. In any event, BCL must not interfere with any "plan compliant" satellite system even though these are not yet on the planning horizon.

1/ CTD stands by our belief that any antenna "optimised" for a single (band I) channel will have compromised (degraded) performance when modified to function on 2 (or 3) band I channels. The amount of degradation may not prove significant and could escape measurement detection by being small. This is a "percentage of bandwidth" problem, an immutable law of physics not easily overridden by even clever design techniques.

2/ The difference between an antenna that will "work" and an antenna that works well is always controversial in antenna design circles. RCA Chairman David Sarnoff once made this point by disconnecting the outdoor antenna from a short-wave set he was demonstrating to Prime Minister Churchill, during the early days of WW2, and replacing the antenna with a piece of common cotton string. The reception from the USA disappeared. Then Sarnoff poured a glass of water on the string which caused it to take on poor but detectable properties of copper wire and the reception returned after a fashion. To mild exclamations at this "marvel" Sarnoff then poured a salt shaker's contents on the wet string and the reception improved, perceptibly (salt making the wet string a better electrical conductor).

Other DTH satellite usage is possible in "non planned" bands and use is made of both fixed-satellite (FSS) and broadcasting-satellite services (BSS) frequency allocations in the band 12.2 - 12.75 GHz. The BSS part operates in the 12.5 - 12.75 GHz range under a specific footnote (s5.493) and a certain level of radiation is permitted in this band. The recently announced SKY expansion on the OPTUS B1 satellite will be in the 12.5 - 12.75 GHz range and is therefore clear of the BCL DDN and the "planned" BSS bands. Dish sizes are expected to be 60 cm average but some areas may need larger sizes to improve performance under rain fade conditions. Other satellites will have different orbital locations and thus may well be able to cover New Zealand using the same frequency bands. Some TV services may well "broadcast" in the 12.2 - 12.5 GHz FSS portion of the bands using lower PFDs and such systems will therefore require larger dish sizes to compensate for the lower power levels.

There are presently few terrestrial services in the 12 GHz bands in New Zealand and there should be no major interference problems with the new services unless specific equipment spurious responses occur.

CTD Note: Our report raised concerns that terrestrial use of the 12 GHz region bands by BCL could create difficult or intolerable interference situations for SKY and others who will over the coming year seek to reach New Zealand homes with satellite origin signals in the same portion of the frequency spectrum. Hutchings believes there to be sufficient spectrum space to accommodate all users. We remain sceptical that no interference will occur and report that a Mt Eden (Auckland region) observer equipped with a 60 cm dish and a standard 12.2 to 12.75 GHz receiving system has been monitoring TV1 and TV2 transmissions with this home satellite dish system from the Waiatarua (Auckland) site for several months. If these transmissions are experimental in nature and are actually inside the 12.2 - 12.75 GHz region, BCL can cure this potential problem by shutting down the experimental transmitters. If, on the other hand, BCL is and has been operating only in the 11.7 to 12.2 GHz region then the reception of their transmissions in the 12.2 - 12.75 GHz region must be accounted for by some other explanation. There are several, none worthy of detailed discussion here - but all share in common that if it is already happening before SKY begins broadcasting, this "out of band" reception (interference) could become a serious problem as the number of SKY DTH installs multiplies in the coming months.

If BCL has been transmitting within the 12.2 - 12.75 GHz region, for test purposes, they should be advising the Ministry (no such records exist in Ministry files as we asked Hutchings to check on this for us). If BCL has never used the 12.2 - 12.75 region for their tests, then we indeed have a problem that begs a solution - now.

SKY PREPARES TO LAUNCH SATELLITE SERVICE

A cyclone of uncertainty

SKY Network hopes to light up Optus B1 transponder 5, in 1/2 transponder format, for initial testing the week of March 24 - 31. Their actual Scientific Atlanta 9 metre antenna supported Mt. Wellington uplink site is not scheduled to be ready for testing until around April 7th. The test transmissions scheduled the week of March 24 may in fact originate through an uplink at Wellington until the Mt. Wellington equipment is completed.

SKY held a press conference on February 27 during which it announced formal details of its SKY DTH plan. Few of the details revealed differ from those previously released during SPRSCS '97 and as published here in CTD as far back as last August.

1) SKY hopes to increase its penetration from the present "265,000 - 270,000 homes" (Nate Smith statement to press) by "40,000 over the coming year." Of interest, the admitted present subscriber count is almost precisely the same as last July after SKY acquired sporting rights to a number of New Zealand events.

2) SKY would not confirm the amount of equipment it has ordered for the DTH rollout but CTD has been able to verify that one primary part supplier in the home system has a 15,000 unit purchase order which is currently being filled. (Nate Smith on this issue replied SKY's initial order of equipment will "roll over" [repeat] as sales dictate.)

3) SKY begins one day seminars on South Island Monday March 24 to teach their newly signed installers the finer points of making a Ku-band satellite system work. A container load of 60 and 76 cm size (Winegard) antennas with (CalAmp) LNBFs is expected to arrive in Christchurch for South Island use the same week.

4) Consumers will pay $650 for the 60 cm dish, LNBF, cable and installation. The consumer will not purchase from SKY the Uniden analogue receiver nor the VideoCipher decoder required to unscramble the transmissions; they will remain the property of SKY.

SKY appears to be following with DTH their existing terrestrial policy regarding the flow of the antenna (+LNBF) portion of the system. SKY acts as an "importer/distributor" for these parts, having arranged with Winegard, California Amplifier (CalAmp) and others the initial hardware sourcing. Once in the country, DTH installers are expected to purchase the equipment from SKY and keep this equipment in stock. This gets the 60/76 cm dishes and LNBFs "out of the SKY warehouse" and produces income for SKY while the installer acts as a "holding station" pending instructions to install a system for the consumer. When the consumer arranges (orders) the DTH system, makes full or down payment to SKY, the contract installer is then advised to make an installation. When the installation is completed and paperwork turned in to SKY, the installer will receive a cheque for (1) the LNBF, (2) dish [both of which he previously "purchased" from SKY], and 3) the installation (see below).

The installer is expected to "warrant the installation" for a five year period (there is some grumbling over this one!) and to do any service calls required if the system breaks down within that period of time. If the service call reveals a hardware (dish, LNBF, receiver, decoder) fault, SKY will pay the installer a contract fee for the service call. If the service call is because the installer has not done something correctly, the installer will "eat" the cost of the call.

There are some "traps" here for unsuspecting players. For example, suppose a customer is unable to make their decoder/VCR connection work for some reason. Their complaint: " *I cannot tape SKY Sport.*" If the problem is caused by an equipment failure, SKY treats it as a warranty claim. If the

The SKY $650 INSTALLATION - What It Involves

How much money SKY pays for the individual parts to its DTH home dish system is not published by SKY and what follows is therefore a studied analysis based upon our contacts within the industry.

1) $650 will not pay for an MPEG-2 DVB digital IRD receiver and the companion electronics required. However, SKY is starting with a lower cost (to them) Uniden analogue receiver, and a VideoCipher decoder.

2) The 60 cm antenna has a US$20 range price tag, without the mount. The LNBF has a US$30 region cost. SKY will "sell" these" items to authorised dealers in the region of NZ$90.

3) The antenna mount, cabling will add an additional NZ$30 to the cost of the installation; now we are at $120.

4) SKY's cost for the (Uniden) analogue receiver is estimated in the range of NZ$110, the VideoCipher decoder in the region of NZ$60. Now we have a total of approximately NZ$300.

5) SKY DTH installers will "bid" for a "contract price" to make DTH installations. Assuming the average bid price is lower than $350 (it will be) SKY will actually NOT lose any money on the $650 it is charging the consumer.

6) However, the $650 price includes one year of SKY Sport service. The "retail value" of 12 months of SKY Sport is difficult to pin down but it is not any less than $25 per month ($300 for 12 months). Therefore, at the $650 total price for installation and one year service, SKY is giving up approximately the value of the SPORT service at retail for each subscriber signed to the service. This is the so-called "subsidy" of SKY for the DTH installation.

SKY dish installers are bidding on a complete system install. A 48 page contract created for installers includes two detailed pricing schedules (C and D) which the bidder must complete. These contracts were due back in SKY offices March 17th. Of interest - some critical to proper installation technique details seem to be blatantly missing from the contract - including a specified quality of cable (which they describe as "Times Fibre RG6 or better") for the often troublesome run between dish and receiver. There is a giant learning curve ahead for installers and SKY's primary reliance on terrestrial aerial riggers could be a troublesome decision.

problem is due to a consumer not pushing the correct buttons on their VCR or DTH remote, the installer "eats" the call because part of the installation procedure includes the requirement the installer fully explain the operation of the equipment to the customer. A customer unable to retain the instructions, a customer home with several family members of which the one instructed is not the one making the complaint call - all of this goes against the installer and he is forced to cover these circumstances at his own expense.

5) The $650 fee includes "one year" or SKY Sport channel service, measured from mid-June 1997 onwards. One way to look at this: For 12 months service consumers will be paying $54 per month ($650 divided by 12). What the consumer will own at the end of one year is a 60 cm dish, some cable, an LNBF with a new value not to exceed $120 (at SKY cost). The consumer cannot recover the portion of $650 that went towards the installation nor will the consumer own the receiver and decoder. (There is likely to be consumer confusion on this issue as many of the press stories have been written to suggest the consumer is "purchasing" the satellite DTH system for $650, "installed.") And, in fact Business Section reporter Nick Stride of The New Zealand Herald, on questioning Nate Smith on this issue, was told, "*They pay for the DTH system, we give them SKY Sport for a year - if they sign-up before June 20.*"

6) When SKY changes from encoded analogue format to digital format transmission (now expected June 1998), SKY will reclaim the analogue receiver + decoder and replace it with an MPEG conditional access IRD (integrated receiver + decoder). The Uniden analogue receiver will become surplus to SKY needs, possibly disposed of to another start-up DTH service elsewhere in the world. The Videocipher analogue decoder will be taken back for possible reuse in the SKY terrestrial TV distribution system since this is the same decoder SKY already uses in (commercial installations) for their terrestrial service network.

The cost-to-SKY of the MPEG digital IRD is unknown (even to SKY) at this time. This will depend upon supply factors currently plaguing the MPEG world being solved before SKY really needs these IRD units. If the units were purchased today in the current marketplace, SKY would pay at least $550 for each IRD. One year from now, SKY believes the price will be significantly lower - and industry analysts suggest it may come down to $300 per IRD by April 1998.

As a comparison, the least expensive consumer level MPEG IRD now being sold through satellite dealers is priced in the range of NZ$800. This number compares favourably with the to-SKY-cost of $550 for the same grade of IRD purchased in sizeable quantities by SKY.

7) SKY's Nate Smith told the assembled press (February 27) they plan to replace the single analogue channel (SPORT) with "up to 20 MPEG digital service channels" at some date between 1 April and 30 June 1998. SKY's offer of $650 (all up) for the analogue DTH package inclusive of a year of SPORT was said by Smith "to expire in June (1997)." In other words, the bonus of free SPORT for a year is a limited time offer pivotal to the point in 1998 when SKY plans to abandon the single analogue channel and upgrade to multiple MPEG service channels. Smith also added that "later in 1998" SKY plans to expand to as many as 40 digital channels.

SKY has an agreement with (Australian) Optus satellite to utilise half of a full transponder only for the transmission of SPORT. Optus transponders are nominally on 63 MHz centres meaning that the edge of one transponder "touches" the edge of the adjacent transponder every 63 MHz. A one-half transponder nominally occupies 27 to 30 MHz and utilising this much space for a single (analogue) TV service channel is common practice.

When, in 1998, SKY expands to digital service, three full transponders (5, 6 and 7 on vertical polarisation, Optus B1 at 160E) will be put into service. The MPEG digital will first appear on transponders 6 and 7 while the analogue SPORT service will continue to allow change out of the consumer receiving equipment; all of this in 1998. Transponder 5 will be then be recycled for the expanded MPEG programme channels.

In the first 20 MPEG channels to be released SKY believes it will appeal to virtually every identifiable special interest group; an example will be Golf enthusiasts with "The Golf Channel." SKY is not saying but logic suggests they will offer virtually any combination of programme channels within the 20 channel set on a mix and match basis - each channel will have its own price tag and the viewer will select how many he or she wishes.

In the final set of MPEG channels, Nate Smith said the firm will supply movies NVOD (near video on demand). NVOD means that a single movie is assigned to perhaps four of the 20 MPEG programme channels and each of the four starts the movie in 30 minute increments; such as - 8PM, 8.30PM, 9PM and 9.30PM. At 10PM the first channel (8PM) restarts the same movie an additional time. With 20 MPEG programme channels dedicated to this purpose, 5 movies (20 divided by 4 start times) can be offered simultaneously, each with 30 minute staggered start times. In effect, SKY DTH NVOD becomes a form of "satellite delivered cinema." Viewers will decide which movie they wish, and also select the particular start time desired.

All of this will happen through a telephone line modem connection built into the MPEG IRD. Installers for the SKY package will be expected to interconnect the existing telephone line on premise to the IRD through the in-built modem. The software to support the NVOD will be built into the SKY package and IRD. Users will have an on-screen display listing the movies available and the start times. Through their IRD hand held remote they will select a movie and start time. Their selection will then be transmitted through the telephone in-built modem to the SKY computer. Here the customer ID (IRD) number will be registered while the customer account will be debited with the movie charge. At the movie start time a "turn on" signal addressed to the specific user IRD will be transmitted, unlocking (decoding) the movie for their viewing.

If this sounds ambitious, *it is* - today. But by the end of 1998, numerous similar systems now turning on elsewhere in the world will have pioneered this service and SKY will be spared being a "pioneer" in a new world of high technology. But there is another element as well.

Consumer level MPEG IRDs are today anything but user friendly. Even trained technicians find them intimidating and difficult to properly "navigate" through the viewing options. An installer who today installs an analogue single channel (SPORT only) system as a contractor for SKY will be required to return to the same home sometime in mid to late 1998 to install the first MPEG IRD equipment. It is a given that consumers will find the IRD operational controls very difficult to master. The number of service calls required to educate every member of every consumer family as to the proper operation of the MPEG IRD will be significant. And remember - the contract installer is "warranting" trouble free operation of the system for five years time. With DTH consumers spread through rural areas and travel difficult and expensive, being a SKY contract installer may not be the smartest business opportunity facing a fellow these days.

INSTANT Feedback

Consumer reaction to the $650 price in rural areas has been surprisingly favourable. Typical questions:

"What happens at the end of a year? Can I give it up if I don't like the pricing for the digital services?"

"Do I own this equipment? Can I sell it to somebody else if I don't want to keep it?"

"Can I hook up my neighbour to the same dish?"

There have been some settling in miscues. Nate Smith told the press, "*The dish system costs $650 and the subscriber receives SKY Sport without additional charge for a year.*" This immediately attracted the attention of pubs and other public spots who presently pay as much as $100 per week for SKY terrestrial service. It did not take long for them to figure out they could drop the SKY terrestrial service, purchase a dish, and they believed for a one-off payment of $650 have SKY Sport for a year without additional cost. SKY's damage control team responded quickly to squelch that option, creating the story that, "*This is a package of equipment and service costing $650 for one year (*$54 per month*) and SKY is subsidising the equipment portion.*" In fact, as our analysis on page 7 here shows, the "subsidy" is the programming, not the equipment. Consumer Manager Tony O'Brien was then quoted saying, *"the dish system is really free, the SPORT channel is $54 per month paid in advance* ($650 total)." SKY will spend the next several months setting the record straight on the many variations consumers believe they see in the offering. Perhaps the most amusing miscue occurred with respect to the Chatham Islands. Here several different SKY people, each apparently working on their own 'private Chatham deal,' have suggested various schemes to service the islands. One scenario had the Chatham area single channel VHF TV service (see CTD June 1995; 95-6-19)

taking SKY Sport in lieu of the present tape and satellite fed TVNZ programming - and NZOA paying for SKY Sport on behalf of the Chatham locals. That originated, SKY sources say, at NZOA but by late February it was no longer an option. Chatham residents have already indicated a willingness to install their own 2m range dishes and subscribe to the service. SKY has ordered no dishes at this point larger than 1m in size from source Winegard and the 1m dishes are intended to be used for commercial installations on South Island where heavy snow accumulations will create special receiving problems for normal 60/76 cm size dishes.

INL PULLS PLUG ON SKY DEAL (1)

Timing of announcement raises eyebrows

Less than 24 hours after SKY's February 27th press conference, INL (Independent Newspapers Limited) placed a press announcement on its Internet Home Page. The announcement said:

Independent newspapers limited

INL Home Page | Other press releases | Latest news from INL

February 28, 1997

Sky negotiations end

The Managing Director of Independent Newspapers Limited, Mr Michael Robson announced today that negotiations for the purchase of a shareholding in the New Zealand pay TV operator, Sky, were at an end.

Mr Robson said that regrettably it had not been possible to structure an agreement which would have been satisfactory to all the parties involved.

"The Board of Independent Newspapers Limited came to the view that it was no longer possible to pursue the transaction in the form proposed, despite the best efforts of all those involved."

Mr Robson said the INL Board was disappointed by not being able to complete the deal. A number of issues had not been able to be resolved. However, he said these issues did not involve TVNZ which had been an enthusiastic potential partner of INL and had assisted INL during the negotiations.

Mr Robson added that INL believed Sky was a good company and admired the progress it had made in establishing itself over a short period of time. INL would be keen to look at any opportunities to develop business associations with Sky that may arise in the future. He said he was certain that the move to multi-channel digital satellite transmission would be successful.

INL first announced it was negotiating to purchase a shareholding in Sky at its annual meeting in October last year.

INL Home Page | Other press releases | Latest news from INL

1/ News report as headlined in March 1st edition of The New Zealand Herald.

What attracted curious press people concerning the wording of this INL announcement was the generous praise being heaped on TVNZ (described as "...*an enthusiastic potential partner of INL (that) had assisted INL during the negotiations.*"). A reporter from The New Zealand Herald was unable to obtain confirmation from TVNZ that it had in any way "*assisted INL during the negotiations.*"

Optimists were reading into the fifth paragraph that INL and SKY might still find a way to bridge over the chasm that had resulted in *"it not being possible to structure an agreement which would have been satisfactory to all the parties involved."* There is no on or off record comment or statement from anyone involved in the negotiations to lend credence to that possibility.

INL waited until SKY's long scheduled February 27th press conference introducing SKY DTH to make its announcement. Some found this curious and suggested that INL had reached an impasse in the negotiations some time prior to the 28th of February announcement but deliberately waited until SKY had created its own headlines before dropping the bombshell. To these pundits it was apparent INL did not want to mess up the SKY DTH announcement by taking away lustre contributed by a possible Rupert Murdoch ownership involvement in SKY before the DTH announcement.

For Murdoch it was a busy week. On February 25, ASkyB, the Murdoch controlled North American DBS service scheduled for launch within the next 12 months, announced agreement to invest US$1 billion in existing DBS provider Echostar. The Murdoch announcement caught most of the DBS world by surprise because if the merger of ASkyB and Echostar is allowed to proceed by (US) federal regulators, Murdoch will control 6 orbital slots and operate 7 DBS satellites.

Here are the details:

1) Echostar was the third entrant into the North American DBS field and at the end of its first year claims approximately 200,000 subscribers.

2) News Corp. owns 80% (with telephone provider MCI) of ASkyB, a yet to operate DBS service provider that purchased in an FCC auction the most strategically located orbital slots available for CONUS (continental United States) coverage.

By combining the orbital assets of Echostar and MCI/News Corp., the new entity will "control the majority of the (CONUS) DBS slots." Murdoch and Echostar head Charles Ergen share a common vision of where DBS is headed. Both believe that as quickly as possible DBS should operate with narrowly focused beams that cover only one city (i.e., New York) or one region (i.e., southern California). In this way the DBS coverage patterns can combine all of the local terrestrial TV (and radio) stations in an area with the national (i.e., HBO Movies, ESPN sport) and international (i.e., CCTV China, BBC UK) programming with each region semi-tailored with programming for its market. Ergen has loudly forecast and promoted this concept from the launch of Echostar, Murdoch has spoken in favour of the plan since Ergen began the crusade. This is in direct opposition to the "all for one - one for all" concept promoted by the earlier DBS entrants (Hughes, AlphaStar et al) who see satellite as one national service.

As a practical matter, satellites with such sculptured coverage patterns (covering smaller regional areas, separately from one another) are only now on the drawing board and will not exist for several more years. However, Echostar says it will launch an "interim" style satellite before end of 1998 to demonstrate how its regional service system will function.

That the News Corp purchase of 50% of Echostar has any relationship to the INL plan to drop negotiations to buy controlling interest in SKY Network Ltd is purely speculative. The range of pricing suggested by sources at SKY for the acquisition of SKY by INL ranged upwards to NZ$800 million; or US $560 million at present exchange rates. For this, INL would have gained control of a company with 265,000 present subscribers, hoping to reach 300,000 over the next 12 months. For US$1 billion, Murdoch gets a jump start on his ASkyB project by acquiring at least financial control of Echostar which presently has 200,000 subscribers but promises to grow into the million-plus range in the same 12 month period.

More likely the end of negotiations with SKY by INL were tied not to the US purchase of Echostar nor even to problems in structuring SKY after acquisition - but rather they are connected with recent changes in the Australian pay TV (DBS) world; a subject we will explore here in the next CTD.

TECHNOLOGY BYTES

...BITS and BYTES you may have missed in the rush to make a dollar ...

March 19, 1997 / Issue 97.02/35

Satellite TV and Radio

ESPN2, secondary cable sport service transmitted in "test" mode on PAS-2 for approximately one month, terminated at 1PM March 12 on 3707.5 MHz (Hz) . Service, reported in March 15th edition of SatFACTS, was in unique SCPC "stand alone" PowerVu format which for reasons not yet understood could be widely received with a range of free to air MPEG digital consumer grade receivers. ESPN2 has no known affiliates or users in the Pacific or Asia but was also transmitted in FTA mode on PowerVu MCPC bouquet during July and August (1996). ESPN2 specialises in coverage of auto racing, (US) collegiate sporting events and is considerably more "American" in content than more familiar ESPN (International) service which forms bedrock of SKY's sport channel in New Zealand.

Japanese Entertainment Television (JET TV) began testing five programme channel service March 15 in PowerVu format on PAS-2, Vt (3962); FEC 1/2, Msym 13.740. Service is running continuous loop video and audio, same on all 5 programming channels, at presstime. JET was first announced last August (CTD 9706, p. 13) as "24 hour all Asia-Pacific entertainment channel" to include "documentaries, drama, animation, variety" to be in four languages (English, Japanese, Thai and Mandarin) with production facilities provided by Jupiter Programming in Singapore. Ownership last August was reported as US cable giant TCI (International), and (Japanese) Sumitomo with programming "drawn significantly from Nippon TV and Tokyo Broadcasting." Initial testing suggests a sizeable dish (4m or larger) will be required in New Zealand; distribution policies have not been announced.

Rimsat R41, located at 130E since 1995, is finally reported "moved" to 161E. The satellite was to have moved last October following partial clearing of users (RAJ-TV, others) as an interim satellite to be used by one of the two Filipino domestic satellite firms as a temporary relay until their own can be launched. If and when this satellite fires up from this location, the assumption is it will be boresighted (centre-beam-pointed) into the Philippines. If this is true, coverage on the various hemispheric transponders will be quite unlike the former footprints from 130E. Bottom line - keep an eye on 161E for LHC (left hand circular) signals on the normal Russian satellite design transponders (i.e., IFs of 1475, 1425, 1375, 1275). R41 is now approaching serious inclined orbit movement and will vary +/- 1.2 degrees or more from a nominal over-equator location.

ZakSat is Kuwait firm which has leased a 36 MHz bandwidth C-band transponder from AsiaSat 2 with plans to create a wide area Internet and "Multi-Media" direct to user service before the end of 1997. Operating under the trade name of ZakNet, the firm believes there is a "strong demand for satellite Internet, games and an array of other interactive applications, all on one digital set-top box at the touch of a remote control button." ZakSat plans to utilise the uplink services of ex-Rimsat Subic Bay Satellite Systems, Inc. (SBSSI) which is a Filipino

OPTUS SATELLITE TRANSPONDER CHANGES

Major transponder changes are underway for the Optus B1 and B3 satellites in preparation for significant new pay-TV users scheduled to begin regular operations July 1st. A detailed review of the changes will appear in CTD's next issue (April 23). In in interim, look for the following B3 moves:

1) Transponder 12 ABC South Australia (B-MAC) will move to TR2 (polarity change) April 16.

2) Transponder 14 Imparja (B-MAC) will move to TR7 (polarity change) April 16.

3) Transponder 15 ABC Northern (B-MAC, full transponder) will move to 1/2 transponder 12 (+) May 15th (receivers will require new IC for 1/2 transponder format).

4) Transponder 14 Imparja Northern (B-MAC, full transponder) will move to 1/2 transponder 12 (-) May 15th (receivers will require new IC).

5) ABC South, now on TR12, will turn off May 15th while ABC North and Imparja North (TRs 15 and 14) will turn off on May 28th.

facility that currently transmits programming to Rimsat / Gorizont satellites located at 130 and 142.4E. The SBSSI facility has increasingly been less and less used by Rimsat customers as the Rimsat satellites have begun to be significantly "inclined" in orbit, resulting in many previous programmers using Rimsat moving on to newer Intelsat satellites as well as PAS-4. ZakSat was established in 1996 and is a joint venture between Zaid Al Kazemi Sons Trading (ZAK) and Kuwait Investment Projects Company (KIPCO). The firm says they jointly manage "a diversified portfolio of business operations and investments in areas of information technology, media, telecommunications, security, environment, ecological engineering as well as paramilitary and industrial applications." Contact is Mr. Mario J. Pino, General Manager, ZakSat, at tel 965-4730-711 and fax 965-4730-833 (e-mail: mario@ncc.moc.kw).

Nokia Satellite Systems AB (Finland), provider of the to-date most versatile FTA MPEG DVB receiver product tested in the Pacific, has been "swamped" by positive response to their product and is trying to sort out the priorities. The firm produced an initial 100 quantity run of their 9500 S software version 1.63 receiver in December and this receiver has been extensively tested and reported in our SatFACTS publication. Late in January an additional 500 of this model was produced under the part number 2053 but with significant differences: This model does both C and Ku (the 1.63 is only for C-band) and it includes an automatic search mode for new MPEG signals. The 2053 was initially created to test the Chinese market where 9 new regional MPEG SCPC telecasters began operation in January (CTD 9701, p. 8). Late in January Nokia appointed Genesis Plastics and Electronics (Hong Kong) to distribute the 2053 for SE Asia. Genesis is a part of the Taiwanese 'Long Time Technology Group' which may also be developing a FTA MPEG receiver of its own at this time. During February Moubic was selected to distribute the same receiver from Japan, International C & T Company in ZhengZhou (China) and Barcom for Europe through Sweden. G & G Imports (Australia) and Telsat Communications (NZ), as previously announced, continue as distributors for the Pacific region. Within China, the model carries part number 2000 S and is software programmed for Mandarin users. Our March 15th SatFACTS reported the 1.63 software version has previously unsuspected abilities to decode certain free to air PowerVu transmissions, something that Nokia advises they were not aware of themselves. Based upon this input, a third software version is scheduled for release in mid to late April which will seek to expand upon the PowerVu reception capabilities of the basic unit. Nokia believes the European Bouquet (EBB) market in Asia and the Pacific is "not significant" and admits it is not presently concentrating on producing a purpose-specific receiver for this region of the world and EBB "at this time."

The late March / early April expected arrival of "Taiwanese" designed MPEG receivers which are reported to work with PowerVu free to air transmissions as well as DVB Compliant transmissions from the European Bouquet and others - are not Taiwanese after all!. The source of the various units promised through Australian distributors (see SatFACTS Monthly, p. 27, February 1997) is Hyundai, a Korean firm that also happens to own major US MPEG technology house TV-Com. This information narrows down the range of potential competitors in the "does everything" MPEG receiver field - previously it appeared two or more Taiwanese suppliers were leading the technology here but now there is only one firm with this special expertise at this time.

Scientific-Atlanta PowerVu units, model D9223 sold from June 1996 onward, "may" be taken back by Sydney office for "software update" that will give the receivers limited ability to access (without reception glitches) FTA DVB Compliant services such as the European Bouquet. SA Sydney is expected to reach decision around 1 April whether it will be possible to expand the capability of receivers to include DVB Compliant service. If they decide to go ahead with this programme - which is in response to significant complaints from D9223 users who had expected this ability to be built-in to begin with - the likely price for the update is A$85 per unit. On top of that, the D9223 owner will have to pay for shipping the unit to and from Sydney and if outside of Australia deal with the sometimes complex and time delaying requirements of custom agencies. This "fix" may not be satisfactory for all D9223 users as it appears you must re-enter complete programme access numbers through the installer menu for each service when you change services. Another possibility under consideration: A new software version that incorporates the desirable FTA + PowerVu functions in one unit, available late April (?). Details from Elizabeth Jennison at (tel) 61-2-9452-3388 or (fax) 61-2-9451-4432.

UPDATE (additions) to SatFACTS Pacific/Asian Region Digital Watch
(See pages 26 - 27 SatFACTS Monthly, March 15)

Service	Satellite	Polarity	RF	IF	Msym	FEC
JET TV (1)	PAS-2	Vertical	3,962	1,188	13.74	1/2

1/ [**Japanese Entertainment Television**] Five programme channels, all in continuous loop video and audio test mode from March 15th, PowerVu format.

AUSTRALIA'S DEBT RIDDLED CABLE STRUCTURE

Financing of the Australian highly competitive cable TV rollout remains shrouded in corporate mystery and some Australian observers believe the truth of the debt is far greater than announced by the two primary cable developers; Foxtel (combining News Corp and Telstra) and OptusVision (with US telephone operator US West as a significant stockholder).

At the root of the mystery are several elements all scheduled to come into public focus during 1997.

1) On July 1st there will be a deregulated marketplace. Where previously competition could not emerge, it will. And this will include entry into the marketplace of non-Australian pay TV firms who will market to Australian homes via DTH services yet to be announced.

2) Public financing of cable is promised by Telstra (which, as a government owned company seeks to partially privatise by year end) and Optus Communications had originally planned to float public late last year.

3) In reports issued early in March, Telstra-News Corp owned Foxtel admits to A$98m in losses for six months ending December 31st. Their original business plan projected losses of A$150m during calendar year 1997. They are running deeply in advance of that projection. Optus similarly admits to A$83m in losses; observers believe the figure to be twice that.

4) To partially improve its losses, Telstra has announced a 1200% increase in line and time charges for Internet providers effective May 1. The largest Australian Internet provider will see its monthly telephone bill escalate by A$7m ($84m per year) if these controversial rate hikes occur. Telstra attempted to gain government approval for rate increases for either local telephone calls or failing that for connect time for data carrying lines. The Government said "no," although Telstra presented evidence claiming 31% of their entire system capacity is tied up by data during business hour periods.

Cable losses cited (above) are operating losses - above and beyond the cost of rolling out the hybrid fibre plus coaxial cable plants. Foxtel and Optus can capitalise (and eventually earn back on) plant construction costs - they cannot do so with operating losses. The new buzz word in Australia is "rationalisation."

What it means is this. After more than a billion in rollout costs and operating losses, Telstra, Optus and even the government are coming to the "rational conclusion" that the marketplace is not large enough to support total competition. The key word here is "total."

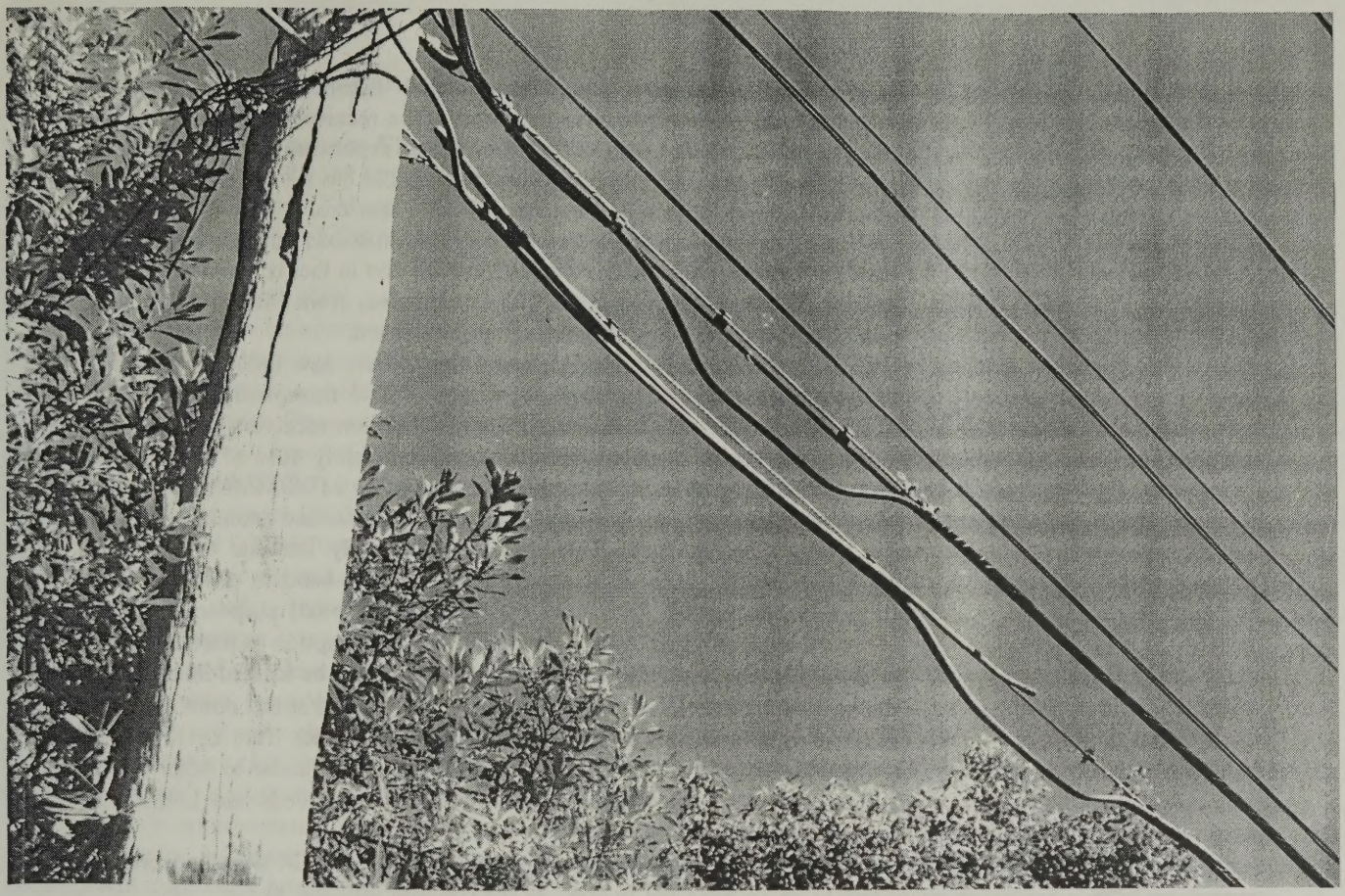
To cut back on their joint massive losses, it is reasoned that all further competitive cabling of areas should cease. In fact, for at least the immediate term, all new cabling should cease. Where Foxtel only operates, it is rationalised, Optus will gain access to Foxtel cabling. Where Optus operates, Foxtel will gain access. Where both operate, cables that have been created parallel and in competition will be "rationalised" back to a single cable system.

Then both major services (Foxtel and Optus) will become available to consumers through a single drop cable in a joint programming venture. Foxtel has its programming strengths, so does OptusVision. And both will continue to be fiercely competitive (for now) in acquiring new programming.

The "rationale" for the consumer is, (1) an end to dual cabling in areas where even one cable has been a source of irritation to local councils, (2) one set top decoder box offering programming from both.

Individually, Foxtel and Optus had come to the conclusion they will dramatically scale back all new cable construction by the end of May. Neither wanted to continue this high risk, very expensive game of racing to the homes. As an interim solution to reaching homes that will still not have cable available when new cable construction halts, both Foxtel and Optus will greatly expand their marketplace by initiating national beam (Optus satellite) DTH packages. Optus is already testing such an MPEG-2 digital service (12.438 GHz, Hz, B1) and plans expansion of that using two more transponders in April (B3, possibly 12.563.6 and 12.626.2 - both horizontal); Foxtel, perhaps under the trading name of Austar, plans expansion (perhaps to B3 12.501Hz).

What this is likely to mean is an end to the "everyone-loses" cable trench wars in Australia, setting the stage for a battleground that focuses solely upon the programming content issue. In theory, anyone subscribing to either service will have some freedom of choice between "basic" cable and "premium" level service.



END TO TRENCH WARFARE? This Sydney suburb has two sets of cables in place; lower is Foxtel which on close examination (lower right) is "dangling" unconnected while next up is OptusVision which is actually offering service to homes in this region. (Lines above are telephone 'drop" and power)

For third party players, the probability that Optus and Foxtel will be combining cable plant use is not good news. More than 50 CATV / SMATV federal licences have been granted and many of these firms can only construct cable in provincial regions if they have access to the Optus or Foxtel controlled programming. It is likely that neither firm will be willing to sub-licence new cable operators in areas not cabled by themselves as this would conflict with their new interest in servicing the balance of the by-the-end-of-May regions with DTH rather than cable.

One additional hurdle remaining is the federally granted authority to local councils to regulate the installation of satellite dish systems. The Australian government is studying a plan to implement a new, sweeping "National Satellite Telecommunications Policy" which would, amongst other things, remove from local councils the legal right to regulate DTH dish systems. If such a new law is adopted by Cabinet and passes the hurdles of Parliament, DTH receiving systems in Australia will be free to go ahead without local council consent or regulation.

Other challenges: The ownership is Optus remains embroiled in a complicated court suit unresolved as CTD goes to press. Seven Network, owning 2%, claims Optus Communications (46.5%), US West (46.5%) and Publishing and Broadcasting (5%) are in breach of a shareholders agreement. If a court hearing agrees, the trio could be ordered to transfer their interests to the non-defaulting party (Seven Network). Such a result is unlikely - but before this matter is settled Seven is sure to extract some form of penalty from the trio.

Finally - with Australia deregulating all areas of Pay TV on July 1st, there is serious interest in adding Australia to areas covered by firms such as HBO Asia. In Fact, HBO has been seen "testing" distribution of its movie service via an Optus transponder in recent weeks. So while the Australians scramble to get into position to deal with each other, outside forces are planning their own invasion. It will be an interesting year for Australian pay TV.

Scientific Atlanta Sydney has received initial shipment of ten (10) model 9234 "Business Version PowerVu" receivers; most (if not all) have previously been promised to anxious buyers. The receiver has an IR (remote) for operation, is intended for applications which require less skilled operational expertise. Price is US$1,250 (list) and there is no "PanAmSat discount" at this time. The more sophisticated D9223 has a $1,295 price tag but only because of a bulk purchase price negotiated by PanAmSat for users of PAS-2 services.

MCM (Music Video), popular EBB programmer, has begun encoding of transmissions through Eutelsat for European viewers. Service has not reached decision concerning AsiaSat 2 service and in fact is honour-bound as a partner in EBB not to encode. However, that does not preclude MCM moving away from EBB and arranging its own Asia coverage separate from the bouquet group - and then encoding. Stay tuned.

Indostar-1 satellite heading to 107.7E in July will be proving ground for entirely new breed of satellites. Satellite is "economy model" operating in S-band (2.5 GHz frequency region) with 5 transponders capable of carrying between 40 and 48 MPEG-2 DTH service channels using Pace or Thomson receivers at DTH end. Satellite, launch and ground equipment is costing Indonesians US$150m, approximately 40% of what typical C-band only satellite costs. S-band wavelengths are in same frequency region used by MDS/MMDS, are easier to receive with less sophisticated reception equipment, require significantly less complicated antenna structures and for Indonesia and neighbouring tropical regions have bonus of being virtually immune to rain fade (attenuation caused by heavy rains). India, Saudi Arabia have experimented with S-band in past and India continues to use single S-band transponder channel for "community (health, educational) purposes." Should Indostar-1 prove viable in world dominated by C and increasingly Ku-band, they hold option to purchase three additional satellites as well. Finding orbital slots for S-band use is also a bonus - they can be located immediately adjacent to C and Ku-band birds without interference and as virtually nobody uses S-band at this point, virtually any location desired is available. Only other serious interest in S-band at this time comes from DAR (digital audio radio) firms who believe this frequency band would be suitable to deliver digital audio to receivers on earth. Downside: It will be very difficult to find competitively priced S-band antenna feeds and LNBs with everyone concentrating on C and Ku-band frequency ranges.

BSkyB profits rose 27% for 6 months ending December 31st; subscription revenue up 27% and advertising revenue up 32%.

Pace Microtechnology, beset with falling value of public stock and resignation of co-founder, has signed licence agreement with US General Instrument. Pace will now be able to produce Digicipher II format MPEG receiving equipment for cable and satellite applications. GI had attempted to purchase Pace during 1995. Pace is one of four "short listed" firms vying for contract to build ASkyB IRD units which will be required last half of this year. Pace says if they win contract to support IRDs to Murdoch ASkyB service, plant to build units will be established in Mexico on joint venture basis with yet unnamed firm.

General Instrument claims to have developed digital (MPEG) compression "system" which will shoehorn 16 programming channels into 24 MHz of transponder space. The announcement is significant because fitting more programmes into available satellite spectrum space is a cost saving move, and, because no doubt the system will be proprietary to GI which means any programmer electing to use the system must also select GI receivers to go with it. Of all MPEG compression firms, GI has been "least interoperable" and has shown virtually no interest in meeting the rest of the industry on the 'DVB" (compliant) playing field.

Pace and Hitachi have co-developed PC card that allows direct connection from satellite dish to computer equipment. Card is based upon Hitachi SuperH RISC-321 chip and DVB components, claims capability to download data at speeds greater than 56 kbps (which will be new modem speed in US later this year).

OptusVision DTH tests have begun using Optus B1 (12.438 MHz), a national beam which suggests some possible reception in favoured regions of New Zealand. Try Msym 29.473 and FEC 2/3rd.

German EBB partner Deutsche Welle is changing schedule from 1 April, with same time / seven day English, German and Spanish time blocks. English will run 1-2PM, 7-9PM, 12mid-2AM, 5-7AM, 9-11AM. Present DW schedule is 10 hours per day English, new schedule 9.

Digital TV and Radio

US FCC is pushing broadcasters to implement HDTV "within year of finalising of rules" but broadcasters say this will be an impossible task because the transmission equipment does not exist nor will it be available in quantity in next 18 months. FCC had originally given US broadcasters 6 years to turn on HDTV in major markets, now says it feels the time table should be sped up by as much as 50%. FCC reason for speed up: It wants the existing analogue TV channels (mostly VHF and mostly in prime portions of the spectrum) "back" so they can be recycled for two-way radio and other new technologies. FCC (US Government) stands to earn billions of dollars in revenue by reselling these frequencies; some US$7.9B in 1997, $9.3B in 1998. Issues to be decided - how much transmission power will be allowed for 'DTV' channels. Ultimate goal is 67km service

radius from each transmitter site but unknown is absolute power level to be allowed. Under consideration - 500 kW and 1 megawatt.

Thomson Consumer Electronics head believes HDTV will reach 1,000,000 sets annually by end of 2002, four years after HDTV formally launches in North America. Forecast is based upon "normal 7 year replacement cycle for consumer TV sets" in USA and growing market importance of large screen projection TV receivers for consumers (15% of US homes now have projection or very large screen TV receivers and this is growing annually).

First seven (US) markets for DVD players have been announced with player and software (film) manufacturers co-operating to maximise media hype. Chicago, Dallas, Los Angeles, New York, San Francisco, Seattle and Washington (DC) are being targeted by Panasonic and Toshiba with players "in sufficient quantity to allow newspaper and electronic media advertising." Toshiba SD-3006 is list priced at US$699, will follow with $599 SD-2006. Panasonic DVD-A100 is priced at US$599 and buyers receive $50 rebate coupon when submitted with proof of a DVD (movie disc) purchase. Warner Home Video is co-releasing (movie) "Sleepers" on VHS and DVD as a test of consumer interest between renting (VHS) and buying (DVD). Samsung will begin US sale of model DVD-905 player in April with list price of US$749. Sony is already in the DVD marketplace with model DVP-S7000 player at US$1,000.

Consumer digital still cameras, all of which use CCD (charge coupled device) image pickup technology, may be under serious competitive threat from newly developed CMOS (complimentary metal oxide semiconductor) image detection devices. CMOS units require 1/3rd the operating voltage, assemble more quickly and with less stringent tolerance requirements, and will therefore be less expensive. First CMOS imaging still cameras, from Vivitar, are expected to be priced under US$300 and be available by mid-year.

4 Gb memory chip (DRAM) , world's first with such capacity, has been announced by NEC. In addition to high storage chip capacity, device also works very fast transferring 1 Gbps at 125 MHz rate. How big is 4 Gb memory? Unit will hold 47 minutes of full motion video or 6 hours of audio, all in single chip. Chip physical size is approximately 25mm square. Current computer or multimedia chip technology centres around 16 Mb capacity. Highly competitive memory chip industry is having profit problems; Samsung recently announced it will scale back production during 1997 to 70% of the 1996 level, reflecting an oversupply of 16 Mb (DRAM) chips and falling prices that have seen majors selling product for below their actual cost of manufacture.

Single chip LSI device for encoding MPEG-2 digital TV signals for use in digital video recorders has been announced by NEC. Product is major building block for consumer recording systems for MPEG-2 digital, chips will be available in 1998.

Consumer Electronics

Major agreement in the offering between TV set manufacturers and PC firms to standardise on interconnection system that will allow big-screen TVs to function as computer display. Thomson and Compaq began the discussions, have been joined by Hewlett-Packard, Hitachi, IBM, Intel and Microsoft. Purpose is to equip 27"/685mm and larger TV sets with computer VGA port. Next step is to utilise IEEE-1394 "fire-wire" digital interface and wireless remote options to TV set operating parameters. First product to appear with new interface is Thomson/Compaq 36"/914mm "PC Theatre" scheduled for April introduction. When user selects PC (VGA) input on remote, TV screen resets for computer level display (screen display area is shrunk to ensure edge of graphic icons do not move out of image area, brightness and contrast are reduced on average 15%). Hitachi will be second into market.

Hitachi has introduced miniature MPEG-1 disc camera with 7 built-in software programs allowing user to download, edit, rearrange, recompose video from camera to PC. Camera is proprietary, firm plans 10,000 initial month production and projects 300,000 in world-wide market by end of first year. Price: US$2,400.

Internet distributed on-line video games developed by Total Entertainment Network (TEN) passed 20,000 paying subscribers in first four months of operation. Subscribers receive 5 hours of game play per month for (US)$9.95 and $1.95 per hour for each additional hour, or unlimited play for $29.95 per month.

3D TV video adapter has been introduced by Utah based Advanced Technology Group. User wears RealEyes glasses which convert image of standard NTSC or PAL video into 3D presentation. Up to four viewers can plug into adapter box. Unit processes analogue signal to digital format and displays alternating images for left and right eye. LCD shutter eyeglasses are synched to signal to permit each eye to see only intended image. Each user can adjust "depth" of 3D image with IR (remote) and then store favoured setting into memory for instant resetting when the system is next used.

Thomson Multimedia admits to 1996 loss of US$536 million; companion Thomson-CSF defence group posted US$130 million profit. Thomson is closing Bloomington, Indiana TV set plant with 1,500 employees.

CD revenue at point of manufacture dropped on a per CD basis in 1996; US$12.97 in 1995, $12.75 in 1996. Volume increased slightly from 722.9 million to 778.9 million.

Sony has done surgery on pricing for Playstation system, knocking US$50 off of unit (down to US$149) and reducing first party software releases to range of (US)$10 to $49.95. Move is in response to sales efforts by Nintendo (N64 platform) and Saturn competitors.

Cable/Fibre/MMDS/Pay TV

Galaxy satellite and MMDS distributed pay TV service is implementing changes in "Programme Ratings" system software during March. Presently, all programmes are rated for viewers by suggested viewing age groups and with respect to violence and sexual content. The ratings, however, only go forward for a few hours at a time. Under the new rating software, Galaxy will advance rate programming for 8 full days giving viewers the opportunity to plan viewing and tape recording in advance of the next (24) hour period.

Galaxy has added Super League games on a special channel through an agreement it reached with Super League rights holder Fox. Super League will occupy its own DTH programme channel (20) on Galaxy, and on Foxtel Cable Super League appears on Fox Sport Two channel. Foxtel plans to expand the programming content for their cable service beyond the Super League games after July 1st when Australian government rules will allow importation of non-Australian events for the channel. One major possibility- ESPN2 from USA will "fill" periods surrounding the Super League games (which are being scheduled live and on tape replay).

FirstMedia, NZ Telecom owned cable TV service now operating in segments of Auckland, has added live Mandarin language news coverage to its Singapore TCS based service channel. TVBS, prominent Hong Kong telecaster and TVB, Taiwan based service, are now providing through PAS-2 digital feeds news and lifestyle programming for cable redistribution at 4 and 7PM, 5.30 and 7.30PM, 8 and 11AM and 7AM. Base service provides approximately 18 hours per day of programming originating at national broadcaster TCS. Information from Patsy Rea tel 09-366-8834 (fax 09-356-6917).

Cable giant TCI is "looking for new investors or joint venture partners" according to company President Leo Hindery. Firm has been subject of considerable speculation during past 12 months including suggested cash shortages and is facing US$14.5B debt load. TCI was planning to divide its 13 million plus cable subscribers by the type of service they receive, has now abandoned that plan and will stay with present regional office management system. Adding to TCI woes: Dissident stockholder suit charging company, "failed to properly disclose disastrous financial condition." Suit alleges TCI's Internet business "is a failure, generating large losses," residential telephone business "is failing miserably," computerised operating and accounting systems "are not generating promised savings," company has "failed to control spare parts inventory," ambitious expansion and diversification has "caused expenses to balloon out of control," firm has "overestimated basic cable growth," and, "cash flow has been far below what is required for diversification." Suit has been filed in Colorado District Court and seeks unspecified damages for stockholders. TCI remains a significant shareholder in NZ Sky Network.

Wireless cable TV system operating in Boston region (CAI Wireless) has been granted permission to allow individual home subscribers to communicate directly with the wireless provider utilising a segment of the 2.1 (2.5) GHz band. This move, coupled with transition from analogue to digital (MPEG) delivery techniques, will allow viewers to order individual movies, interface with Internet, access data bases through their wireless (MDS) system without any intermediate use of telephone company POTS (plain old telephone system).

Anti-Porn groups led by the Christian Coalition seek to ban all R and X rated films from pay television in Australia. Presently, Galaxy TV offers an 11PM - 4 AM (eastern time) adult service which claims 10,000 subscribers. The service was deemed "narrowcast" by authorities, removing it from many of the restrictions that apply to broadcast (terrestrial) and general audience pay TV. X-rated (explicit sexual act) videos are presently available by state approval in ACT and NT only but a thriving and sizeable direct mail programme extends the reach of such videos to all of Australia. The Christian Coalition and others included a platform pledge to ban all X and R videos from distribution in Australia by whatever means. Proponents of the continued availability point out that X-rated videos are the only videos presently available in Australia that by content guarantee there will be no "violence." Others point out that films such as "Once Were Warriors" would under the proposed legislation be banned from all forms of distribution in Australia if the intent of the Coalition becomes law.

Australian cable stats: Foxtel at last report claimed "under 150,000 subscribers" against a forecast of 197,000 by the end of 1996 rising to 473,000 by the end of this year. Foxtel now believes the ultimate tally at year end will be closer to 200,000.

UK cable TV stocks fell 10 to 15% following announcement by BSkyB satellite DTH broadcaster that it will participate in consortium to bid for terrestrial digital television in UK.

NBC Asia Network is making small in roads into Australian cable world, fighting previously existing contracts with terrestrial Seven Network. Seven carries (NBC's) Dateline, Today and NBC Nightly News but not live and because of time zones typically between 2AM and 6AM AEST. On April 1, The Tonight Show With Jay Leno and the Conan O'Brien Show will launch on cable's 'Comedy Channel' and NBC plans to introduce additional NBC features through The Arena Channel in coming months.